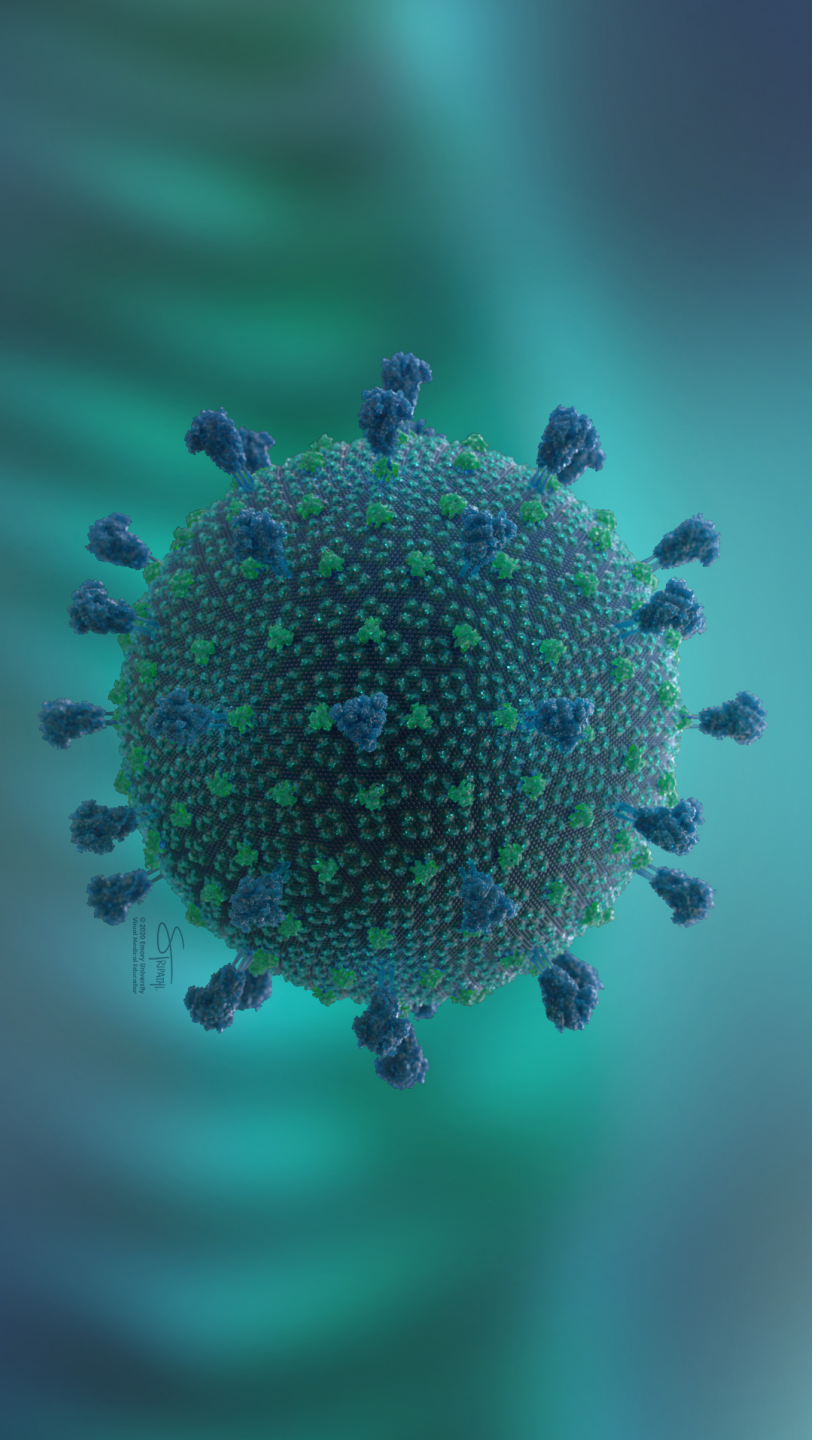


Preparing for the COVID-19 Pandemic

Carlos del Rio, M.D.

Distinguished Professor of Medicine, Global Health and Epidemiology

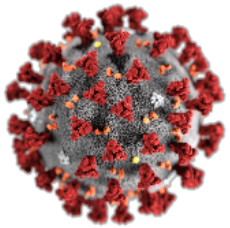
Executive Associate Dean for Emory Univ. School of Medicine at Grady Memorial Hospital

March 19, 2020

**worldwide spread of a new disease that affects large numbers of people*

COVID-19 COronaVirus Infectious Disease 2019

- Coronaviruses are a large family of viruses that can infect many animals
  - Named for the crown-like spikes on surface



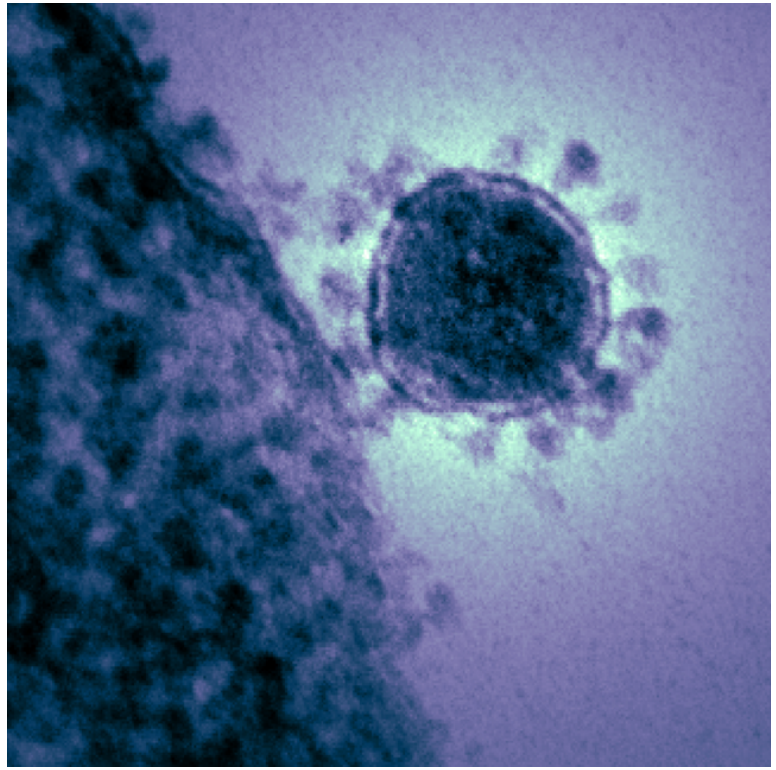
- COVID-19 is a new coronavirus infection
  - Discovered in December 2019 in Wuhan, China
- Coronavirus family includes viruses that cause the common cold, as well as SARS and MERS
  - Although most COVID-19 infections are mild, severe pneumonia and even death can occur
- Natural host for many coronaviruses are bats

- Because COVID-19 is new, a lot is not known

Seven Human Coronaviruses (HCoVs)

- **Common HCoVs:**
  - HCoV-229E (alpha)
  - HCoV-OC43 (alpha)
  - HCoV-NL63 (beta)
  - HCoV-HKU1 (beta)
- **Other HCoVs:**
  - SARS-CoV (beta)
  - MERS-CoV (beta)
  - COVID-19* (beta)

*Coronavirus Disease - 2019

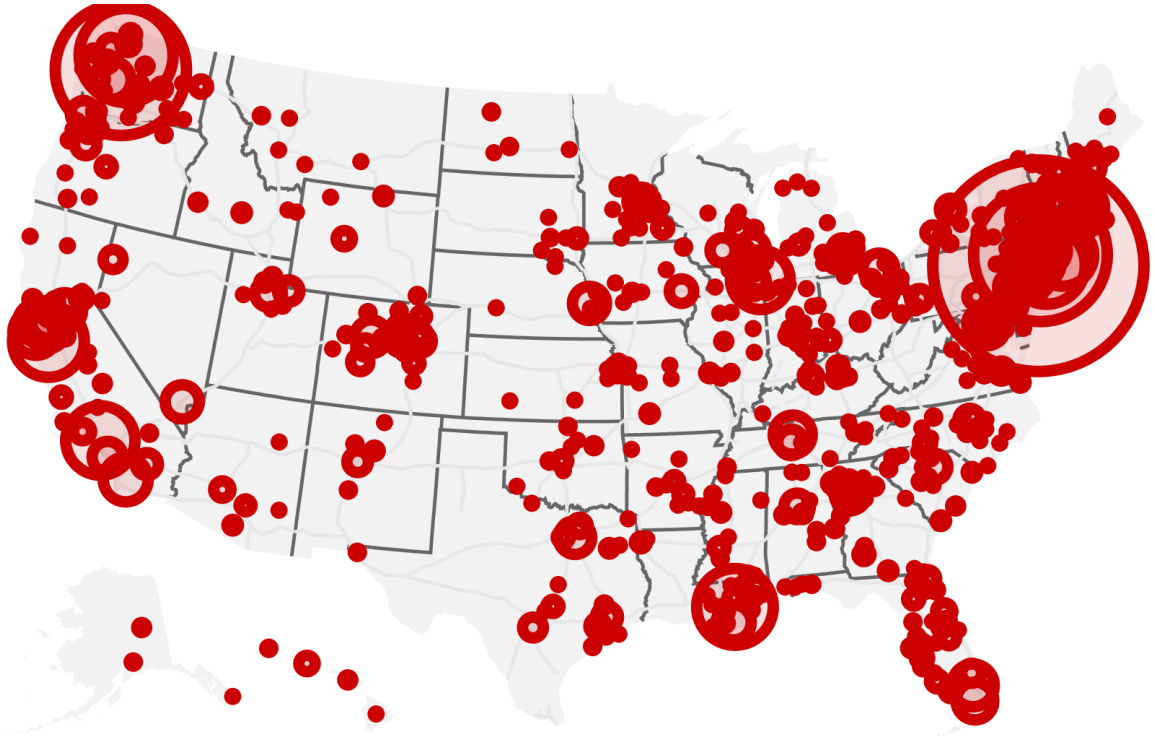


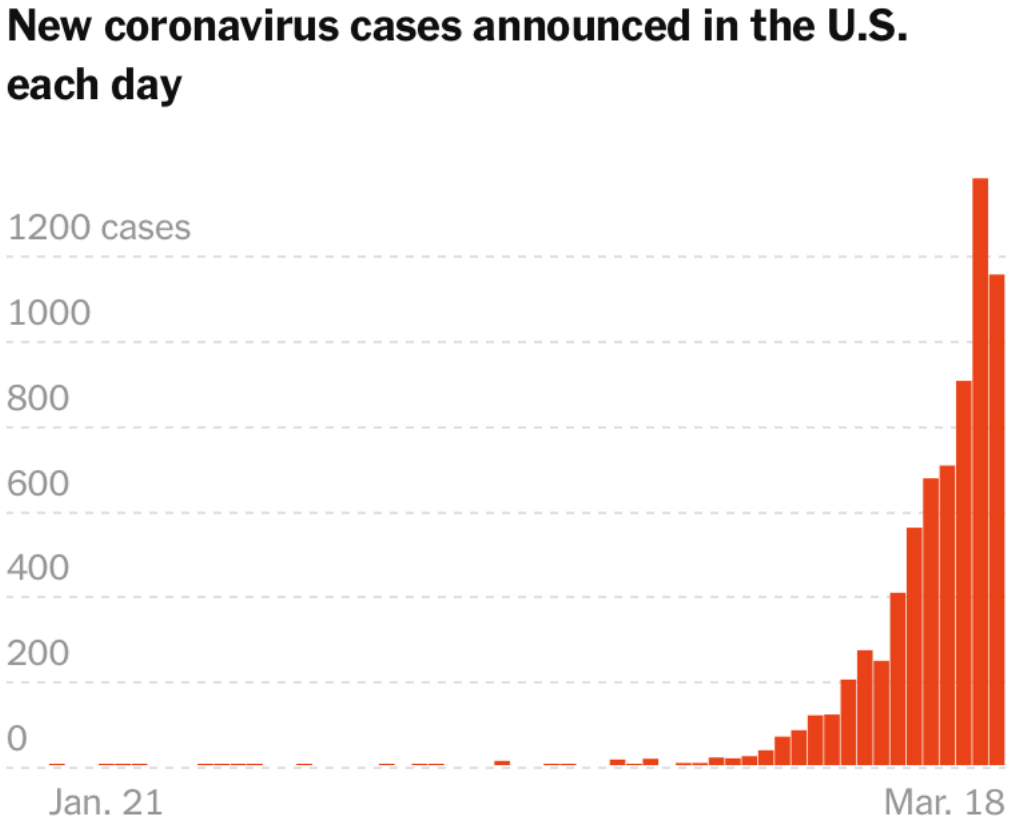
Produced by the National Institute of Allergy and Infectious Diseases (NIAID), this highly magnified, digitally colorized transmission electron microscopic (TEM) image, reveals ultrastructural details exhibited by a single, spherical shaped, **Middle East respiratory syndrome coronavirus (MERS-CoV)** virion.

Current Status of the COVID-19 Outbreak

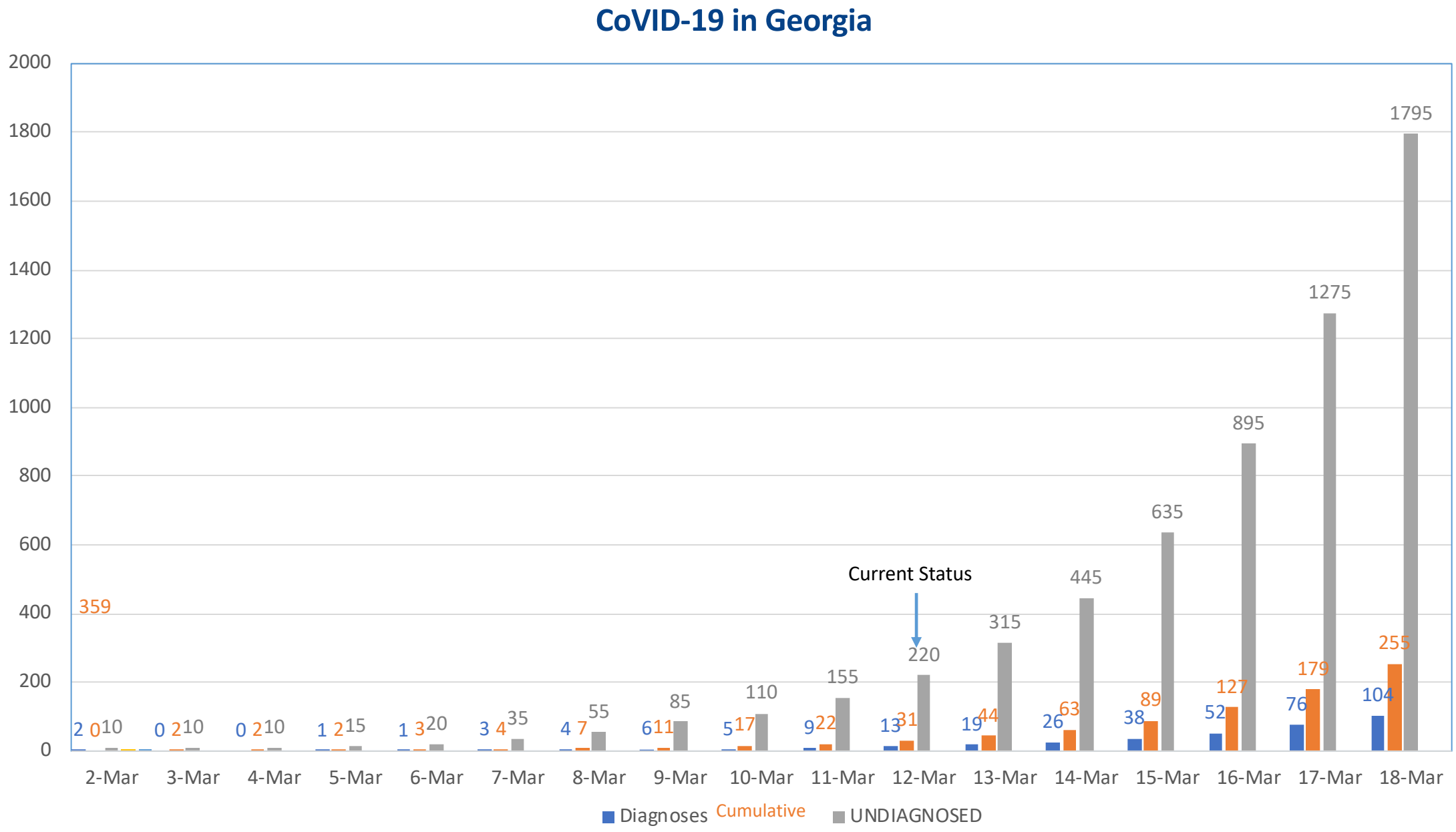
- Global case numbers: > 200,000 cases; > 100 countries & > 8,000 deaths
  - https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6
- US case numbers: > 7,200 cases and 117 deaths (but significant under testing)
  - https://www.cdc.gov/coronavirus/2019-ncov/cases-in-us.html
- Georgia Cases: 197 cases and 3 deaths

COVID-19 Cases in US as of March 18, 2020



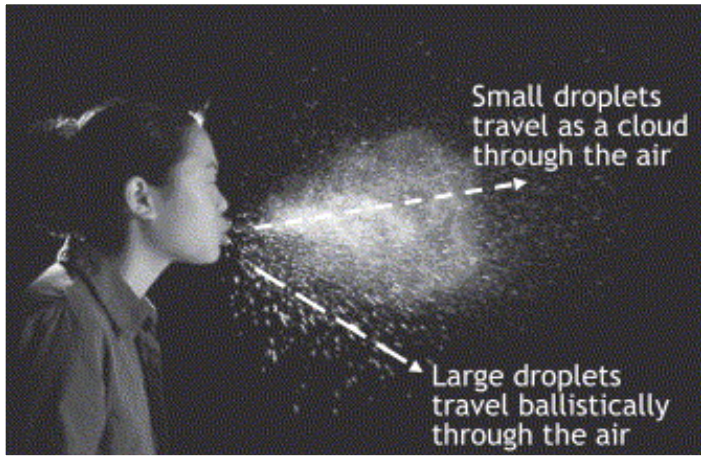


https://www.nytimes.com/interactive/2020/us/coronavirus-us-cases.html


CoVID-19 in Georgia
2000
1800
1600
1400
1200
1000
800
600
400
200
0
2 0 10
0 2 10
0 2 10
1 2 15
1 3 20
3 4 35
4 7 55
6 11 85
5 17 110
9 22 155
13 31 220
19 44 315
26 63 445
38 89 635
52 127 895
76 179 1275
104 255 1795
359
Current Status
2-Mar
3-Mar
4-Mar
5-Mar
6-Mar
7-Mar
8-Mar
9-Mar
10-Mar
11-Mar
12-Mar
13-Mar
14-Mar
15-Mar
16-Mar
17-Mar
18-Mar
Diagnoses
Cumulative
UNDIAGNOSED

COVID-19 Transmission

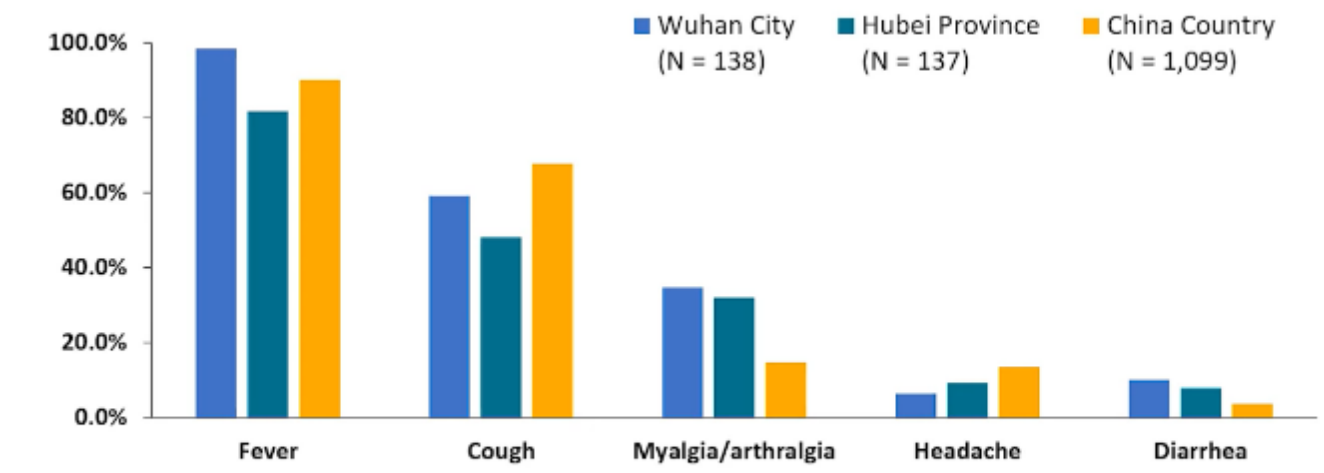
- Respiratory secretions - main mode of transmission
  - Spread through respiratory droplets in the air and that land on surfaces
  - Transmission from people before onset of symptoms or without symptoms possible but contribution off these infections appears to be small
- Stool – unlikely to be a source
- Perinatal – no transmission observed



Tang JW et al, *J Hosp Infect* 2006; 64:100-14.

Signs and Symptoms of COVID-19

- No particular signs and symptoms can discriminated COVID-19 from other respiratory infections such as influenza



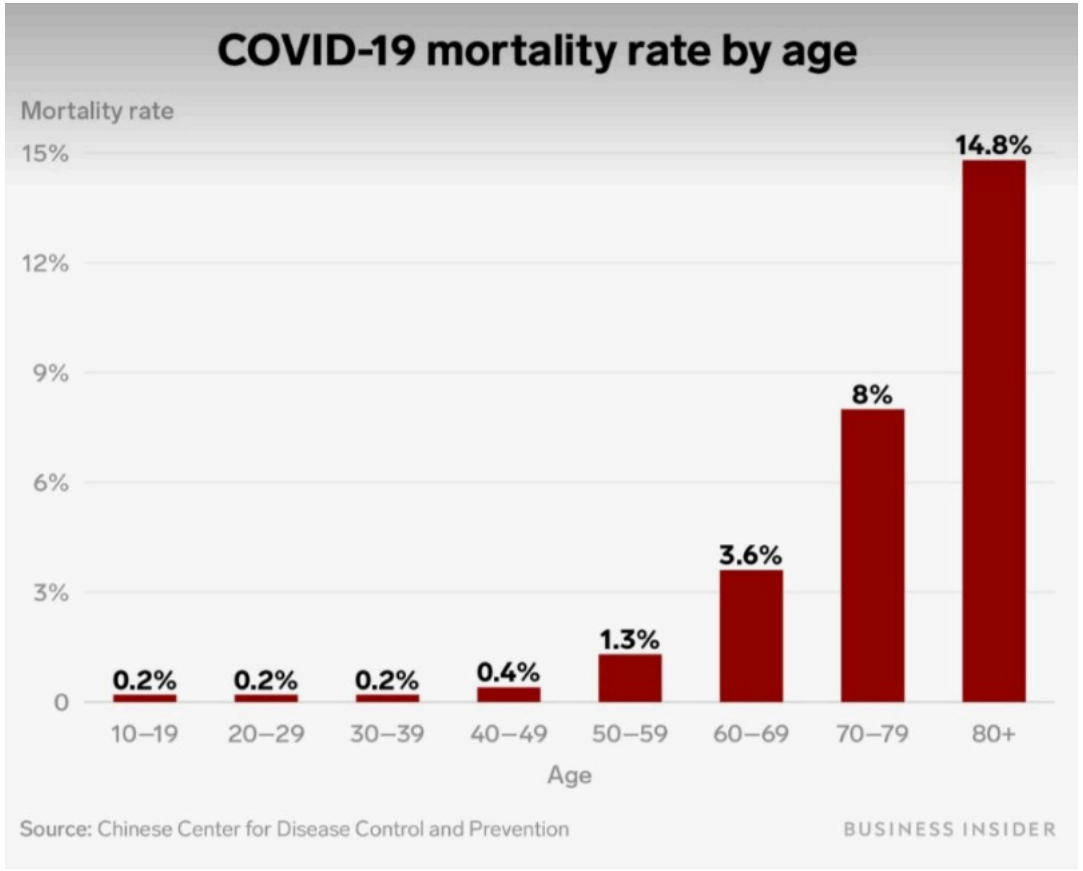
CDC

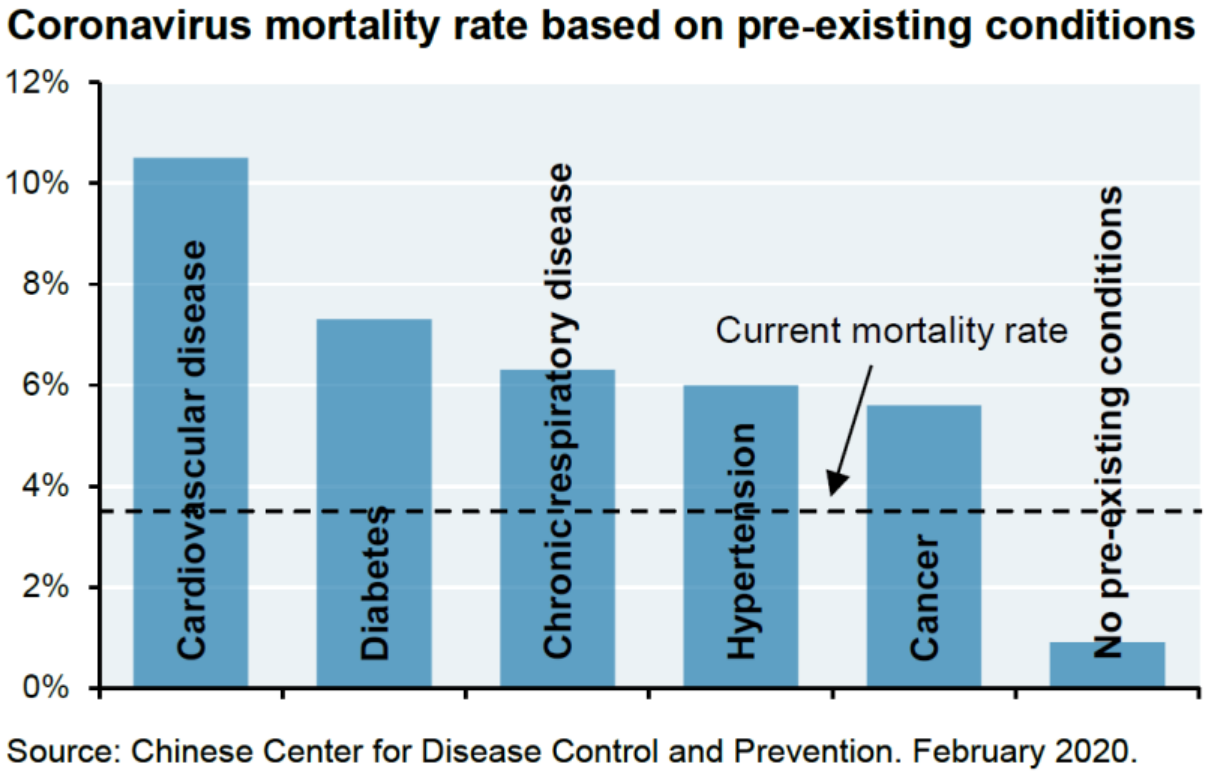
Liu 2020, Chinese Med J; DOI: 10.1097/CM9.0000000000000744. Wang 2020, JAMA; doi:10.1001/jama.2020.1585.
Guan 2020, N Engl J Med; DOI: 10.1056/NEJMoa2002032.

Clinical Course of COVID-19

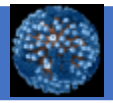
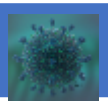
- Incubation period is ~5 days (range = 2 – 14 days)
- ~80 % have mild illness (~80%)
  - fever (83 – 98%)
  - cough (76 – 82%)
  - myalgia or fatigue (11 – 44%)
- ~ 30% of hospitalized patients required intensive care
  - 5-10% require mechanical ventilation
- No approved medication
  - NIH clinical trials have started
- Supportive care has been very successful for most patients

COVID-19 Mortality





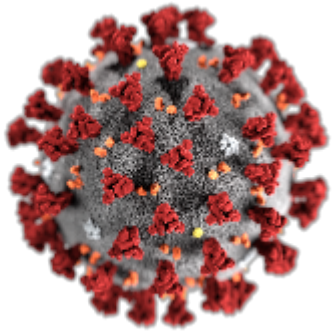
How does COVID-19 Compare to Influenza

	 Influenza	 COVID-19
Biology	Enveloped RNA virus Common in many bird/animal species	Enveloped RNA virus Common in many animal species
Symptoms	Fever, cough body aches Mild-severe	Fever cough, body aches Mild-severe, pneumonia more common
Transmission Incubation	Droplets/contact 2-5 days	Droplets/contact, maybe airborne Usually about 5 days, range 1-14
When does infection occur	Seasonal, fall-winter	Unknown
How contagious	Each case causes 1.3 others on average	Uncertain but likely more than flu
Who is most at risk	Elderly, chronically ill and pregnant women	Elderly and chronically ill, men in China
Treatment	Antivirals helpful if started early	No specific treatments
Vaccine	Yes! Moderately effective	No
Number of infections	About 1 billion annually worldwide 20-50 million in US each year	125,000 cases as of March 10, 2020
Deaths	300,000-600,000 annually worldwide 20,000-50,000 in US	4,600 so far worldwide

Testing for COVID-19

- Testing by detecting RNA of virus
  - Nasopharyngeal swab and Throat swab
  - Lower respiratory sample if possible
- Until recently only available at CDC
- Now available in most state laboratories (GA DPH now has it)
- Commercial lab (Quest, LabCorp, ViraCor) are now available
- Laboratory Developed Test being developed by many including Emory
- Time from sample acquisition to test result is still longer than desired
- Still needed: ability to obtain testing without coming to hospital or busy clinic

Unknowns about COVID-19



- How contagious is the virus and exactly how is it transmitted
- Optimal personal protective equipment
- How long will the pandemic last
- Effect treatments
- When a vaccine will be available
- One thing we can say for sure – expect recommendations to change as we learn more and as the situation evolves

National Preparedness

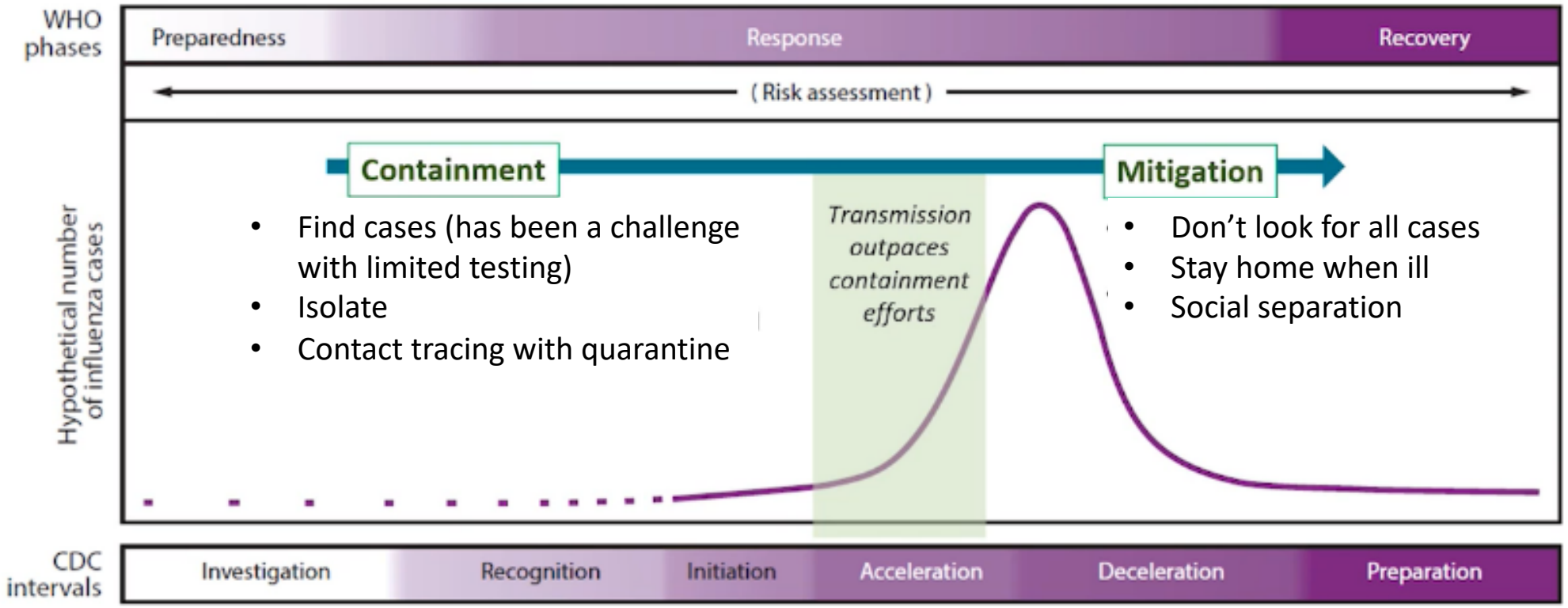
Identify, Isolate and Inform

IDENTIFY

ISOLATE

INFORM

Preparedness and Response Framework for Pandemics



Adapted from: Holloway 2014, MMWR Recomm Rep;63(No. RR-6). Qualls 2017, MMWR Recomm Rep; 66(No. RR-1). Jernigan 2020, MMWR Early Release: February 25, 2020.

Quarantine vs. Isolation

Quarantine

- To separate and restrict the movement of **well** persons who may have been exposed to a communicable disease
- Monitor to see if they become ill
- These people may have been exposed to a disease and do not know it, or they may have the disease but do not show symptoms.
- Quarantine can also help limit the spread of communicable disease.

Isolation

- To separate **ill** persons who have a communicable disease from those who do not have that disease
- Restricts the movement of ill persons to help stop the spread of certain diseases
- Example: Isolation for patients with infectious tuberculosis

https://www.hhs.gov/answers/public-health-and-safety/what-is-the-difference-between-isolation-and-quarantine/index.html

Travel Restrictions

Risk Assessment Level for COVID-19

- Widespread sustained (ongoing) transmission and restrictions on entry to the United States
- Widespread sustained (ongoing) transmission
- Sustained (ongoing) community transmission
- Risk of limited community transmission

Healthcare, School, Business and Personal Preparedness

Preparing your healthcare system

- Review your facility emergency plan
- Create an emergency contact list
- Communicate about COVID19 with staff and patients
- Protect your workforce
  - Screen patients and visitors for symptoms of acute respiratory illness
- Ensure proper use of Personal Protective Equipment (PPE)
- Conduct an inventory of available PPE
- Encourage sick employees to stay home
- Separate patients with respiratory symptoms so they are not waiting with other patients
- Consider strategies for patients to stay home

https://www.cdc.gov/coronavirus/2019-ncov/healthcare-facilities/steps-to-prepare.html

American Hospital Association “Best Guess” for COVID19 over next 2 months in US

COVID19:

- 96,000,000 infections
- 4,800,000 hospitalizations
- 1,900,000 ICU admissions
- 480,000 deaths

Influenza in 2019-2020:

- 35,000,000 infections
- 490,600 hospitalizations
- 49,000 ICU admissions
- 34,200 deaths

“Prepare for the worst and hope for the best”

COVID19 estimates vs Flu in Atlanta

(if no aggressive interventions are done)

	FLU (Estimate annual data)	FLU Actual 2018-19	Low COVID-19 Estimate	Mid-COVID-19 Estimates	High COVID-19 Estimate
Cases *	1,380,265		53,087	106,174	1,380,265
Medical Visits **	648,725		5,309	31,852	690,132
Hospitalizations ***	24,845		2,654	10,617	276,053
ICU Beds******	8,282		1,327	5,309	138,026
Deaths *******	1,380	1,540	265	1,062	27,605
Deaths among 65+ population #	1,035		212	849	22,084

PPE for Novel Coronavirus

1. Face Shield
2. N95 Respirator
3. Isolation Gown
4. One pair of gloves

https://youtu.be/bG6zlSnenPg

Preparing your business and employees

- Empower employees to stay home when sick
  - Remote work and communication solutions
  - Review human resources policies, workplace and leave flexibilities
  - Review pay and benefits available to encourage appropriate sick leave
- Encourage good hand hygiene
  - Alcohol based hand sanitizer at high touch areas (water/coffee dispensers)
- Prepare for wide-spread outbreaks
  - Social distancing (school/daycare closures, restriction on gatherings)
  - Travel restrictions from government or other agencies
  - Absenteeism
  - Develop Enterprise-wide Bio-preparedness (Pandemic) Plans

https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-business-response.html

Preparing your school or university

- Emphasize preventive actions for students and staff
  - Staying home when sick
  - Hand and respiratory hygiene
- Review and prepare with student and occupational health
- Information-sharing systems with staff, students, and partners.
- Review emergency operations plans in case of outbreak on campus
  - Prepare for temporary class suspension and event/activity cancellation
    - Use of virtual classrooms?
  - Prepare for on campus quarantine
- Ensure availability of nutrition and medication
- Ensure continuity of education and research

https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-ihe-response.html

Preparing your family and your home

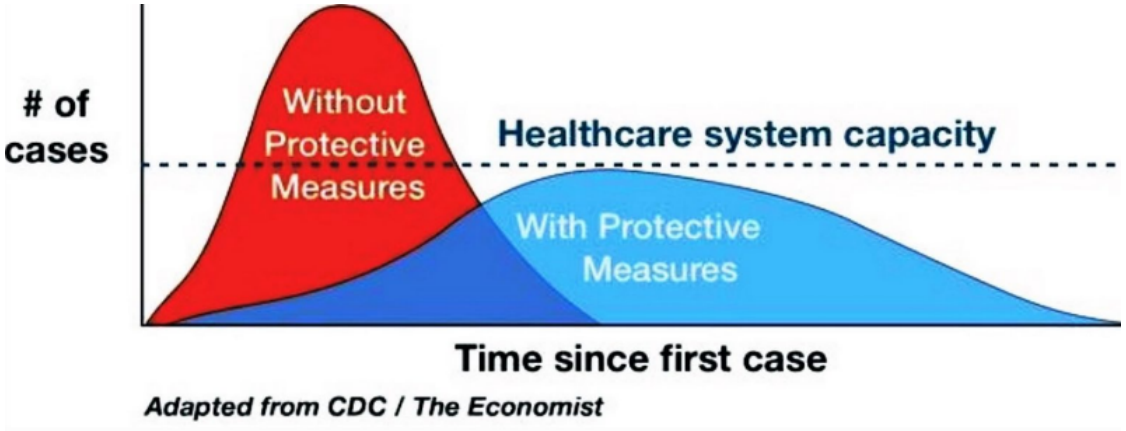
- Re-enforce prevention
  - Hand and respiratory hygiene
  - Vaccinations
  - Appropriate cleaning of high touch areas
  - Avoid sick individuals if possible
- Develop a family preparedness plan
  - Prepare to stay at home if sick
  - Prepare for social distancing (school closures, work closures, etc)
  - Separate room for family member who is sick
  - Have medications and other needs ready
  - Supply of “chicken soup”

Non-pharmacologic measures

- Border screenings/closures
  - Little value at this point
- Mass gatherings
  - Important to prevent them – may have significant impact on conferences and sporting event
    - In Atlanta the NCAA Basketball final 4 and the Decennial Conference in Infection Prevention
- Public transportation
  - Potential place for spread
- School closures
  - Have to be implemented early to have impact
- Isolation of infected
  - Critically important, need testing to identify those infected!

Goals of Mitigation Strategies

- Minimizing morbidity
- “Flattening” the epidemic curve to avoid overwhelming healthcare services
- Keeping impact on economy manageable
- Slowing progression of epidemic to allow for vaccine and other treatment development



Social Distancing

“To limit the spread in the community we need to spread the community”

Social Distancing and Personal Hygiene

At Home

At School

At Work

At a Gathering

https://www.cdc.gov/nonpharmaceutical-interventions/index.html

- Stay home if sick
- Notify MD office before visit
- Limit movement
- Limit visitors
- At least 2 weeks supply of medications and food

- Early
  - Stay home if sick
  - Hand hygiene
- Mild-moderate
  - Reduce large gatherings
  - Reduce mixing
  - Consider distance learning
- Substantial
  - Distance learning
  - Closure

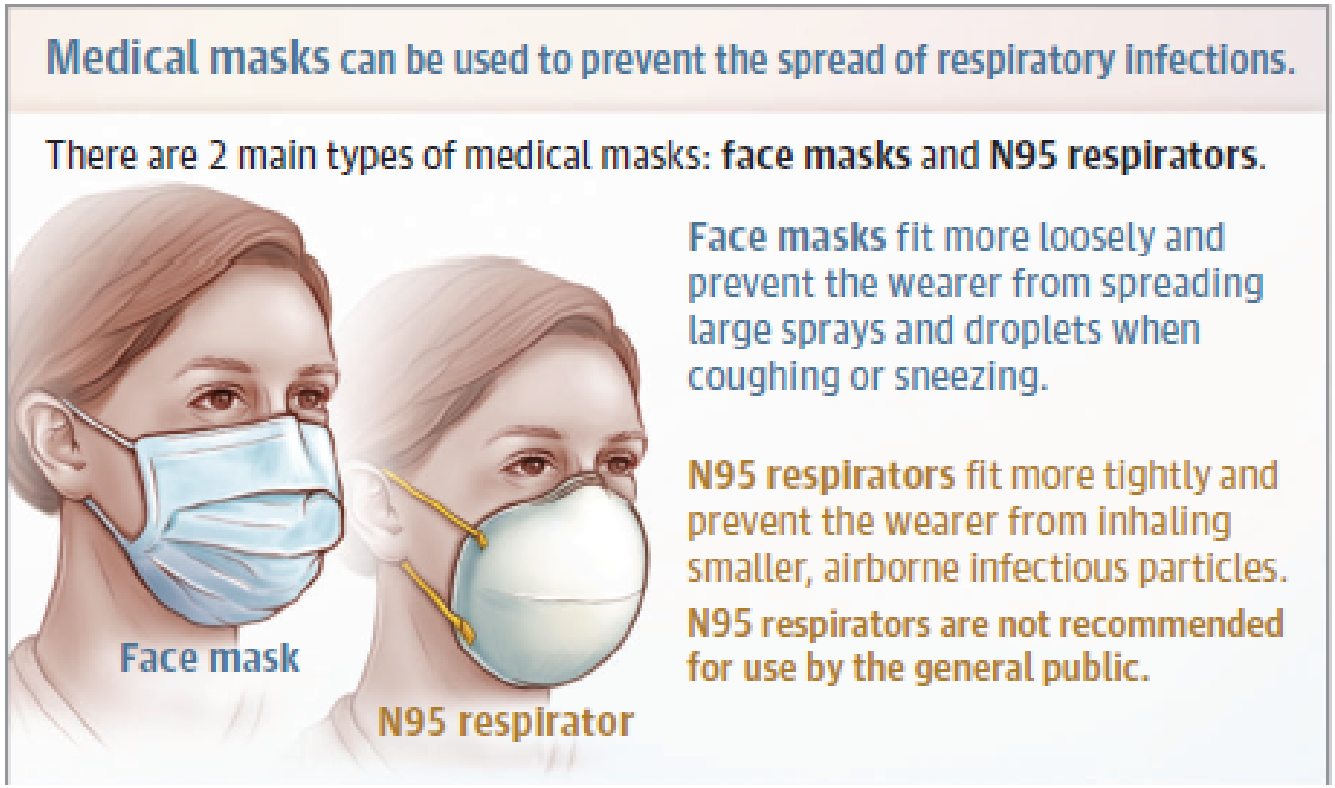
- Early
  - Stay home if sick
  - Hand hygiene
  - telework
- Mild-moderate
  - Reduce meetings
  - Stagger schedules
  - Limit travel
- Substantial
  - Telework
  - Cancel travel and conferences

Prevention advice you can use:

What about masks?

- **Surgical mask:**
  - Meant to protect the environment from the wearer (designed to keep the surgeon's respiratory pathogens away from a patient)
  - Does a good job of trapping large droplets and some aerosols

- **Respirator (N95 Mask):**
  - Fits tighter to the face and is meant to help protect the wearer from inhaling droplets in the environment

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Questions?